

**From:** Rand Crafts  
**To:** Krishna Nand  
**Date:** Thursday, February 15, 2001 9:27:23 AM  
**Subject:** Re: Overview Table for HP\_DensePak Project

Response to request: Data/information for IPP. This is what I have available to this point.

NOTE: Both units are identical. Details provided below apply to both units unless otherwise indicated.

A. Data Items/Questions -

1. Facility Plot Plan.

- Attached Bitmaps (if you have trouble opening these, I can fax (hard to read) or mail).

2. General Arrangement Drawings for Each Boiler (or one set, if identical).

- Attached Bitmaps (if you have trouble opening these, I can fax (hard to read) or mail).

3. Design/Performance Details of Each Boiler including:

(a) Gross and Net MW rating.

- Turbine/Generator 875MW/830MW
- Boiler Current: 6.6M lbs/hr, Proposed 6.9M lbs/hr, at 2975psi, 1005F.

(b) Base load or load following operation.

- Generally baseloaded. Some seasonal variations.

(c) Capacity factors and availability factor for last 10 years.

- Attached Excel spreadsheet.

(d) Projected capacity and availability factors for next 10 years.

- Should remain closely the same as last 2 years.

(e) type of boiler (pressurized, UP).

- Negative pressure (fireside), Natural Circulation, Drum steam separation, Radiant reheat

(f) firing type (wall fired, other).

- Wall fired, opposing sides

(g) number of burners, arrangement, and heat rating.

- 48 Burners, opposing side (24 each), supplied by eight pulverizers with six supply pipes each. Only 36 burners (6 pulverizers) are required for full load operation; we usually operate with 42 (7 pulverizers) for smoother operation. Current heat input design 8352 MBtu/hr.

(h) component design ratings (SH, RH, Eco, APH, others?).

- I have no info on individual components yet.

(i) type of air preheater (tubular, plate, Ljungstrom?).

- Ljungstrom

(j) wet or dry bottom.

- Dry bottom

(k) fan details (ID, FD)

- Four FD fans, two axial flow for secondary air, two centrifugal for primary air. Four ID fans located after fabric filter and before scrubber, centrifugal flow.

(I) Name of each boiler manufacturer.

- Babcock & Wilcox

4. For each stack, specify design exit temperature and flow rate.

- Exit temp average 118F, Flow rate approx. 130 million scf/hr

5. Details of all major modifications (such as LNB installation; conversion to low S coal; etc., if applicable) since inception.

- No major mods; some replacements: LNBs, condenser tubes (from copper to titanium); other changes: permit addition of subbituminous coal as a fuel, re-rating of units from 840 to 875MW, removal of combustion gas reheat, new soot blowers.

6. Specification of each fuel used (bit. coal, sub bit coal, fuel oil, used oil).

- Specifications are contractual, and mine specific. Fuel oil is diesel grade. Used oil must meet on-specification standards as required by EPA. See attached Excel spreadsheet.

7. Copies of any stack tests performed in last 5 years to establish particulate and SO2 removal efficiencies.

- See attached Excel spreadsheet.

8. How was NOx emission factor after modification (0.46/0.47 lb/MBTU) estimated?

- I'll fax modified calculations.

9. Date of installation of Low NOx Burners (LNB).

- Installed as part of original construction of units.

10. Design details of LNBs - supplier, type, etc.

- B&W dual register, Mark V design.

11. Why is NSPS Da compliance an issue since each unit appears to already be subject to Da?

- Yes, IPP is a Da plant. But, if the proposed project is considered a modification under NSPS, then since the project is occurring after the 1997 date of the revised NSPS Da rule, we could be subject to the new 0.15 lb/MBTU standard for NOx.

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**IPP DATA SHEET**Fuel Oil Specifications

Type	No. 2 (diesel grade)
Sulfur	0.50 %/wt
Pour Point	-20F winter max +20F summer max
Cloud Point	0F winter max +40F summer max
Flash Point	+125F min
Heat of Combustions, gross	135,000 BTU/gal

Coal Specifications

Heat Value	10,400 min
Moisture	13.00% max
Ash	15.00% max
Sulfur	0.80% max
Sodium	4.25% max as Na2O

Used Oil On-Spec Standards (40 CFR 279.11)

Arsenic	5 ppm max
Cadmium	2 ppm max
Chromium	10 ppm max
Lead	100 ppm max
Flash Point	100F min
Total Halogens	4000 ppm max
Heat Value	5000 btu/lb min
PCB's	2 ppm max

Particulate Removal Efficiencies (1991 Performance Guarantee Testing)

Unit One	Casing A	99.93%
	Casing B	99.95%
	Casing C	99.96%
Unit Two	Casing A	99.89%
	Casing B	99.95%
	Casing C	99.96%

Particulate Emission Rates (lbs/MMBtu) by Stack Test

	1991	1996	1998	1999	2000
Unit 1	0.0053	0.00989	0.0062	0.0049	0.0073
Unit 2	0.0051	0.00739	0.0037	0.0034	0.0037

SO2 Removal Efficiencies

	1996	1997	1998	1999	2000
Unit 1	92.29	92.19	92.87	93.98	93.75
Unit 2	92.27	91.9	92.47	93.16	93.59

Actual Operational Data - Plant

1998	1999	2000	Avg
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Hours of operation	16683	16462	16572.5
Coal Usage (tons/yr)	5278344	5244793	5264568.5
Heat Value (BTU/lb)	11823	11858	11840.5
NOx Emissions (Tons/yr)	25708.2	24178.6	24934.4
Emission Rate (lbs/MMBtu)	0.41	0.39	0.40
Heat Input (Million BTU/hr)	7481	7556	7518

10-Year Production Data - Plant (Fiscal Year July-June)

	87-88	88-89	89-90	90-91	91-92	92-93
Gross Generation (GWH)	12,291	10,978	13,410	11,406	12,062	12,680
Net Generation (GWH)	11,639	10,396	12,724	10,770	11,408	11,999
Coal Usage (1000 tons)	4,826	4,175	5,080	4,372	4,615	4,837
Net Heat Rate (btu/kwhr)	9,898	9,647	9,616	9,682	9,637	9,566
Availability Factor (%)	89.47	80.15	95.12	92.58	91.45	93.23
Net Capacity Factor (%)	82.81	74.17	90.78	76.84	81.17	85.61

NOTE: Net Capacity Factor is calculated using a common reference of 800 MW net (since upratings in 95 and 96)

93-94	94-95	95-96	96-97	97-98	98-99	99-00	<sup>10yr</sup> Avg
12,901	11,318	10,386	13,365	13,635	13,956	13,858	12,366
12,215	10,764	9,786	12,681	12,928	13,235	13,147	11,705
4,883	4,322	3,976	5,112	5,187	5,296	5,235	4,723
9,551	9,611	9,623	9,500	9,493	9,489	9,506	9,609
92.08	92.48	87.91	93.55	94.76	94.09	93.3	91.41
87.15	76.15	69.63	90.48	92.24	94.43	93.54	83.46